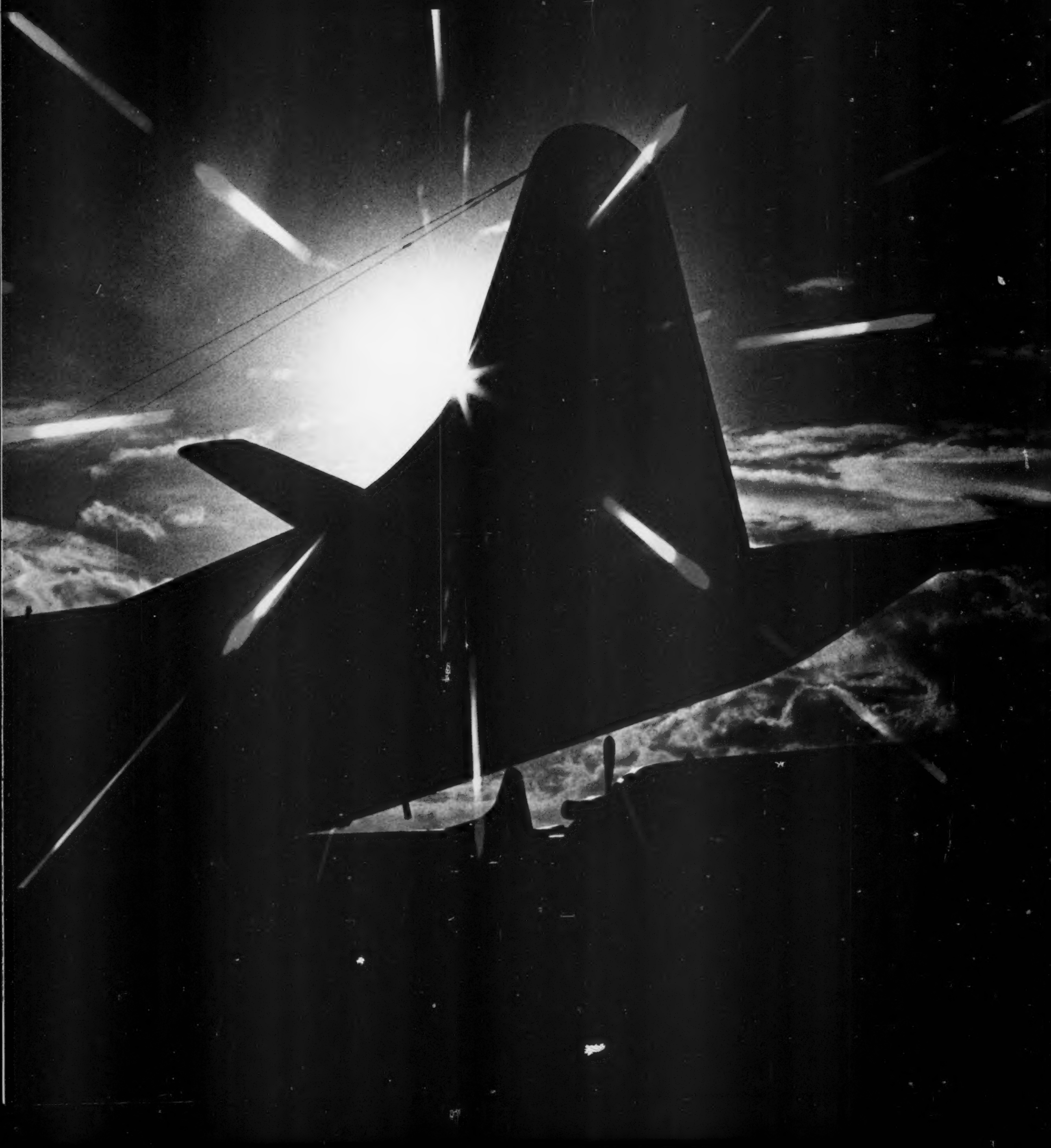
approach

JANUARY 1980 THE NAVAL AVIATION SAFETY REVIEW



Gentlemen and Ladies, We're in the '80s

HARD to believe, but we've just begun the decade that served as the setting for the futuristic novels of not so long ago. Our technology, in many areas, has surpassed the wildest dreams of the average person. Even in our own world of naval aviation, we are at a stage that often seems too good to believe.

We get into a serious problem in our high-performance jet, so we pull a yellow and black handle, get shot from our crippled aircraft, and our parachute deploys. Pull another little handle, our survival kit deploys, and our raft inflates itself. If we think to use our new four-line release on our parachute, we probably won't even need to worry about shroudline entanglement. Even if we do nothing after ejection, our handy little FLU-8/P will inflate our LPA for us upon water entry, and we can take our sweet time getting out of our parachute and deploying our raft.

Sound too good to be true? Well, it's true enough. All of these systems exist; some have been around a long time and some are so new they haven't been completely issued. There are other similarly advanced systems throughout the various communities in naval aviation. All of these systems, however, have a couple of inherent shortcomings worthy of note here.

First, they won't **always** get us out of trouble. Ejection seats have specific envelopes. Eject out of the envelope and we may as well ride the aircraft in. Use the new four-line release when we already have a few broken or tangled shrouds and it'll be like releasing our Koch fittings at altitude.

Second, and more significant, is the fact that none of these systems is designed to keep us out of trouble to begin with. They are designed to help us survive after the unthinkable has happened – we and our aircraft have parted company. So, we are still very much responsible for keeping ourselves and our aircraft flying along happily together.

With all the improvements in procedures and fancy new equipment, it becomes more important for us to remember that good airmanship is still the key to success in our profession. Complete knowledge of our aircraft and its systems, thorough planning, proper technique, and last but certainly not least, good headwork are what keep us from having to utilize our fantastic new survival systems.

As we look forward to the decade of the '80s, let's all take a look and see if our airmanship is progressing along with our technology. If it's not, we aren't really progressing at all.

Vol. 25 No. 7

approach

NAVAIR 00-75-510

The slightly offbeat photograph on this month's cover was taken by AW3 Patrick K. Smith using Patrol Wing TWO's P-3 Orions at NAS Barbers Point, Hawaii.

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SURVIVAL

1 2

CHAIN

By LCDR L. B. Nichols
HSL-32

3 4 5 6 7 8 9

ANYONE that flies aircraft as a profession is aware of the infamous accident chain that is almost always forged prior to every aircraft accident or mishap. Inevitably, aircraft accident boards are able to chronologically list the chain of events leading to a mishap and show that the deletion of any one of a succession of key events would have been sufficient to break the chain and prevent the mishap. In fact, there is usually a direct correlation between the length of each accident chain and the magnitude of the mishap. A potential accident may be held to an incident by the prompt action of a plane captain who shuts an aircraft down, upon discovery of a fuel leak, as the plane is beginning its taxi to the runway. In this case, the plane captain has prevented the forging of one of the final links of the chain.

I believe in the theory behind the accident chain and the lesson it offers. My recent experience as the pilot of an SH-2F helicopter also leads me to believe in a parallel theory which points to the existence of what I shall call the survival chain. This additional theory, simply stated, is that if an accident is inevitable (and I do not subscribe to the theory that all accidents are necessarily preventable), then the survival of the aircrew depends on forging their own survival chain. The inability to forge any one of a set of key links will nearly always result in the loss of one or all members of the crew. To support this theory, I wish to share my recent experience with the reader and point out what I believe to be some important links in my survival chain. Without these links, you would be reading someone else's article in this section of the magazine.

It was a good day for flying. The winds were reasonable and there was very little pitch and roll on the deck. Sea state was one, and the sea water temperature was 78°F. Everyone remarked about how nice it was to be in the Gulf Stream and away from the frigid waters of more northern climes. Although there was some haze which reduced visibility to less than 5 miles, other environmental conditions made it easy to forget the reduced visibility. In short, it was a nearly perfect day on which to give annual instrument checks to two detachment pilots. Unbeknown to anyone at the time, the environment had already forged **link one** of my survival chain.

The crew gathered in the hangar for a brief on the mission and other particulars of the flight. The standard NATOPS items were covered, including ditching procedures and flight gear inspection. Ho Hum . . . You've heard it all before, right? Well . . . maybe, but one additional thing was taking place which may have saved a life. The midshipmen who were to receive indoctrination flights on each half of the double cycle were getting an extra-thorough brief on each aspect of ditching and the proper use of survival gear issued to them. In addition, I doubt if it hurt the old pros any to go through the items to be accomplished in a controlled ditching. **Link two** was properly forged.

No shipboard flight is properly executed without a thorough understanding between ship personnel and the aircrew of the flight profile. The flightcrew briefed every aspect of the mission with the ASAC (Antisubmarine Aircraft Controller) in CIC (Combat Information Center); an area of operations was decided upon that would allow good radar coverage and adequate separation from aircraft operating from a nearby CV. **Link three** was established.

The flight itself was uneventful until 1.5 hours into the second hop of the double cycle. At that time, for some inexplicable reason, the track on the main rotor blades diverged dramatically, making control of the aircraft extremely difficult. There was a violent "one per rev" that was bouncing both pilots up and down in their seats nearly a foot and a half. There is some evidence from cracks in the copilot's helmet and marks in the top of my helmet that both pilots were actually being bounced off the overhead when the severity of the "one per rev" was greatest.

I took control of the helicopter at that point, and in spite of not being able to read any instruments or gages due to the vibration level, managed to get the aircraft into some sort of descent. The controls were extremely difficult to move, and leverage was not easy to achieve while bouncing violently up and down in the seat. Looking

back, I would say that my physical and mental capabilities were certainly fully taxed and that I was relying on judgment based on natural reaction, learned response, and information from the copilot who, upon turning over control to me, began to function as briefed. For instance, he was able to get a "Mayday" out to the ship, provide approximate altitude information to me throughout our descent, and ready the aircraft for ditching in accordance with NATOPS procedures.

At 200 feet, which the copilot called out, I initiated a cyclic-only flare and managed to nurse the aircraft into a position near the water. Although the aircraft would not remain at a given altitude at first, and was alternately climbing and descending between 100 feet and some altitude just above the water, some stability was finally achieved in a very low hover in ground effect.

At this time, the copilot was able to instruct the aircrewman to abandon the aircraft, along with our wide-eyed passenger. The aircrewman did his part by ensuring that our passenger stayed strapped in until the proper time. In fact, at one time the passenger had begun to unstrap before the appropriate time, and our aircrewman rectified the situation immediately. The mere fact that the aircrewman and the passenger left on the copilot's instructions, rather than some time sooner, probably saved a life or at least serious injury. Crew coordination, adherence to the briefed procedures, knowledge of NATOPS – *Voila!* – **links four, five, and six**; the absence of any one of which probably would have meant catastrophe.

The aircrewman and our midshipman passenger (who must have been wondering where to sign up for surface line or the Marine Corps) were now safely in the water, with lifevests on and two rafts deployed.

Back in the aircraft, which was still doing its best to shake itself apart, all was not so rosy for me and my copilot. We realized that even a low air taxi to the ship was impossible, since even a fraction of up collective caused the vibrations to increase to an intensity where several things were apparent:

- It would be impossible to navigate to the ship, which was only 4.5 miles away. The instruments were still impossible to read. Even establishing a basic compass heading was not possible.
- A landing aboard was absolutely out of the question, even if the ship were close enough.
- Sooner or later the aircraft was going to come apart due to the forces at work on its flight controls.
- The sheer physical exertion required to maintain some semblance of control of the aircraft was bound to take its toll, eventually.

The decision was therefore an easy one. We flew the aircraft into the water by maintaining a slightly noseup (4-5 degrees), wings-level attitude, and gently allowing the tailwheel to contact the water. The nose was then lowered slowly into the water, keeping wings level. We were able to taxi the aircraft another 50-100 yards away from the happy members of our crew who had already departed. The taxi was uneventful, except for a sizeable quantity of water entering the cockpit.

There is no doubt in my mind that the water landing training which I had received on more than one occasion at HS-1 was extremely beneficial, and maybe even critical to our survivability in this phase of the flight. The fact that the training which I received was accomplished in a

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different model helicopter made very little difference, since so many elements could be applied to *any* water landing in *any* helicopter. I would therefore strongly support any generic water landing training for helicopter pilots, since I believe it was **link number seven** in my survival chain.

During the shutdown of the H-2 on the water, there was a tendency for the aircraft to lean left. I counteracted this for as long as possible. Eventually, however, one main rotor blade hit the water and the aircraft very gently rolled to the left and turned upside down. I had expected a more violent reaction as one or more blades dug into the water, but I believe that the relative docility of the contact was due to the fact that we had slowed the RPM considerably and the inertia of the head was not sufficient to cause violent breakup and slapping of blades on the surface.

At the 45-degree position, my copilot was out of his straps and came across my seat on the way out. Unfortunately, the pilot's door had slammed shut during the shutdown, when the blade hit the water. Both my copilot (who was swimming around in front of me) and I expected to be greeted by an open space on departure rather than the obstacle impeding our escape. Neither of us are exactly sure how the departure was at last effected, but I do remember pulling several times on the door jettison, which came naturally from ditching drills, and eventually using a fist on the plastic section of the door. Though I cannot be sure, I seem to recall exiting through the *Plexiglas* window with the door very much in place. The distance to the surface of the water, and precious oxygen, was covered quickly by a seemingly jet-propelled kick.

Upon emerging from the depths, I realized that the aircraft was still afloat, although nearly inverted. My toggles functioned as advertised, and soon the entire crew had gathered with our rafts to congratulate each other on the occasion of our "rebirth." In retrospect, I can say that **link eight** in my survival chain was aided in great part by my training in the Royal Navy's helicopter dunker, which I received while on an exchange tour in the United Kingdom. Their trainer is a cabin suspended by a line above a large tank of water. The cabin is lowered into the tank and may roll left or right depending on the operator's desires, which are not known to the trainees. To completely qualify, students must undergo four evolutions (one from each of the crew seats; the fourth being an optional blindfold run).

The actual ditching I experienced in the SH-2F was a perfect recreation of the dunker training I had experienced in 1974 in the U.K. In that course, we even discussed the possibility of the left-seat pilot leaving his seat on the roll left simulation and exiting to the right, either before or after the right-seat pilot. Since this type of trainer finally exists for U.S. Navy helicopter pilots, I consider it imperative that everyone have the opportunity to experience the realism that the new dunker affords.

Rescue by the ship's motor whaleboat took only 15 minutes, which is a tribute to the professionalism of the entire crew of our frigate, considering the distance involved. **Link nine** existed because we were flying from a taut ship which operated in a professional manner. I don't think I have ever been happier to set foot on a U.S. Navy ship, and I'm sure the rest of my crew felt pretty much the same.

So, there you have it. There is no doubt the crew had a hairy ride – hairier perhaps than some, not as hairy as others, but definitely a ride that gave real cause for concern throughout. I believe our crew survived because every link in our particular survival chain was in place. Some were there because the crew had ensured they were there. Some were there because of professionalism of others with a responsibility to the livelihood of our crew. Some, like the almost perfect weather conditions, were there because of sheer good fortune or the blessing of some higher being (depending on individual viewpoint). The lesson is simple: the more links you have forged each time you fly, the greater your chances for survival in an aircraft mishap.

How is your survival chain? ➤

the LPA

a total system improvement

By LCDR John T. Shields
Fleet Liaison, Crew Systems, NADC

THE LPA system has been the subject of no less than three APPROACH articles over the last several months: "You and Your LPA" (AUG '78); "Survival: Some Solutions" (NOV '78); and "A Preserver With Lots of Pull" (SEP '79). Each of these articles explained one improvement to the LPA, yet there is actually a total improvement of the LPA system in progress which incorporates three major changes, none of which can be considered alone if an understanding of the LPA system improvement is desired. Therefore, the intent of this article is to inform flightcrew members of how these individual changes are interrelated, both technically and in the Fleet introduction process.

The three changes to the LPA alluded to above are: 1) replacing the present CO_2 cylinders (28gm) with larger CO_2 cylinders (35gm); 2) for crewmembers flying in ejection seats, replacing the present LPA actuating device with a water-activated, automatic actuating device (FLU-8/P); and 3) replacing the present LPA actuation toggle with a beaded-handle actuating mechanism.

The sequencing of these changes into the Fleet has been directly linked to OPNAV-established priorities recommended by Fleet representatives through the Integrated Logistics Support/Acquisition Management Panel (ILS/AMP). The priorities were established in the following order: 1) automatic actuating device (FLU-8/P); 2) manual LPA actuation improvement (beaded handle); and 3) LPA collar fix (larger CO_2 bottles). The order of Fleet introduction via Aircrew System Changes (ACCs) will be: 1) the larger CO_2 cylinders (ACC 396); 2) the FLU-8/P (ACC 398); and 3) the beaded handle (ACC 405).

Initial quantities of the 35-gram CO_2 cylinders have been procured, and ACC 396 is presently being implemented. You may recall that the AUG '78 APPROACH article, "You and Your LPA," addressed three modifications to the LPA to alleviate collar lobe hangups, of which only one was the larger CO_2 cylinder. The other two modifications, increased collar size and waist casing restrictors, will be held in abeyance pending experience in LPA operation with the larger CO_2 cylinders. This alteration of the original plan was necessary to prevent delay of introduction of the FLU-8/P device (highest priority). The LPA casing modifications required for increased collar size and waist restrictors would have delayed OPEVAL on the LPA with the FLU-8/P device installed. If it becomes apparent that the larger CO_2 cylinder does not completely solve the LPA collar hangup problem, then a fourth ACC will be issued to implement the casing modifications.

The APPROACH article, "Survival: Some Solutions" (NOV '78), introduced the automatic inflator, detailed the design requirements, and outlined the testing required. For further amplification, the automatic inflation device (FLU-8/P) is a one-time, one-shot, cartridge-actuated device which replaces the present manual-actuating device to provide inflation of the LPA assembly upon immersion in water. The FLU-8/P will be provided to crewmembers of ejection seat aircraft only, and will function procedurally as a backup to the manual actuation mode. Due to the high priority established for this program, OPNAV, contrary to established procedure, authorized the procurement of production devices prior to receiving approval for service use; therefore, at the completion of approval for service use, automatic inflation devices will be immediately available to the Fleet. The initial authorized configuration for the FLU-8/P will be with the 28-gram CO_2 bottle. Initial Fleet outfitting will be accomplished through issuance of ACC 398. ACC 398 consists of instructions for the modification of the LPA casing to accept the

FLU-8/P automatic inflation actuating device.

Note warning labels indicating installation of FLU-8/P device.

FLU-8/P, and a kit containing the FLU-8/P devices, batteries, etc. The kits for ACC 398 will be distributed on a priority basis established by type commanders. After initial outfitting, life preservers configured to accept the auto inflation device and FLU-8/P automatic inflation devices will be available separately through supply. *FLU-8/P automatic inflation devices incorporating the 35-gram CO_2 bottle will be issued following approval for service use for that configuration. – Ed.*

The beaded handle for the LPA, as described in SEP '79 APPROACH, will be incorporated as ACC 405. ACC 405 will include the beaded handles as a kit and instructions for modifying the LPA casing. The manufacture of beaded handle kits is pacing this change; however, the implementation of this change cannot occur until after approval for service use is completed on the LPA presently configured for FLU-8/Ps. Therefore, if auto inflator approval for service use is delayed substantially, then the beaded handle change also could be delayed. Delivery of the beaded handle retrofit kit to the Fleet has already been delayed until spring 1980 due to delays in the contractural process. Again, the higher priority of auto inflators dictated that nothing would be done which would slow auto inflator introduction.

Because of the high priority established early in the FLU-8/P development program, it was decided to do both development and operational testing concurrently, with the hope of accelerating introduction of an auto inflator. This decision seemed justified, since similar devices were commercially available and were in use by the Canadian Armed Forces. However, since OPEVAL testing started in January 1979, there were two design deficiencies which forced postponement of OPEVAL. Each unplanned postponement of OPEVAL has necessitated corrective design efforts/retesting to ensure deficiencies discovered have been rectified. OPEVAL was started again in July 1979 and completed in November 1979. Even with the problems alluded to above, the decision to do development and operational testing concurrently should result in getting automatic inflators to the Fleet sooner than otherwise would have been expected.

In summary, the LPA improvements outlined above are all interrelated and should each be considered in the context of a total LPA system improvement. OPNAV, with Fleet concurrence, has established the incorporation of an automatic inflator into the LPA as the highest priority improvement. The key milestone in the LPA system improvement is now the completion of approval for service use on the FLU-8/P device. After this key milestone is achieved, Aircrew System Changes will follow in rapid succession to complete the total LPA system improvement.

A Note of Caution: LPAs equipped with the FLU-8/P automatic inflator shall be worn only in ejection seat aircraft. In the event of a ditching in a nonejection seat aircraft, inflation upon water immersion could preclude aircraft egress. TACAIR pilots riding as passengers in non-ejection seat aircraft must use the appropriate passenger life preserver for that aircraft. Crewmembers in nonejection seat aircraft carrying passengers shall ensure that no passenger is wearing an LPA with the FLU-8/P installed. (LPAs incorporating the FLU-8/P will have warning labels sewn to each waist lobe and to the collar lobe). –Ed.

Think About It!

ACTUAL DISCREPANCY ON YELLOW SHEET:
"Lost No. 3 engine after 3.7 hours of flight."
ACTUAL CREW CHIEF'S WRITEOFF FOR ABOVE DISCREPANCY:
"Found No. 3 engine on wing after 30 seconds of search."

Adapted from USAF STUDY KIT

A CONFIRMED KILL

By LT Burt Miller

AT approximately 1300, 18 June 1979, 20 miles NW of Elizabeth City, NC, a foolhardy bird of unknown species decided to match wits with a pilot in a bad mood, after no breakfast and not enough sleep the night before. The bird was sighted by the pilot and appeared to be attempting to come as close as possible to the aircraft. The look in his eye told the pilot he was only a beginner, and should be no challenge for the veteran. As the bird closed the aircraft, at high speed and pulling his best move to scare the crew, he executed an unloaded diving maneuver which was countered with a hard break to the left and a reversal. (Use of the gunsight at this critical moment was a great aid in calculating closure. Bird at 5 feet equals approximately 50 mils.) Lead pursuit was employed, and even after bird broke to the left (his left), the pilot was able to achieve a kill with the port windscreen by applying max "G" available in the direction of his turn. The bird separated at the port wing/mainmount (foot) area and broke up rapidly, spreading guts, mung, and several partially-digested bugs about the windscreen/canopy area. Confirmed kill was taken, as wreckage spun to the ground and crashed in trees near the collision site. Other attempted kills during the flight were aborted due to out-of-range flightpaths. Aircraft 501 aborted mission and returned to base for normal landing.

• *A curious narrative of a bird strike that we thought you would enjoy. – Ed.*

HUMAN FACTORS IN

By LCDR Richard Shannon, Ph. D.
and
R. A. Alkov, Ph. D.

THE pervasive problem of human error mishaps in naval aviation is currently dealt with through an effective Navy safety program. This program uses specific methods or remedies in order to prevent accidents due to human error. These remedies will be discussed under the headings of selection, training, human engineering, and mishap analysis.

Selection. Selection is based on the recognition of the fact that some individuals are better suited for some tasks than others. "Putting a square peg in a square hole and a round peg in a round hole" is the job of psychological specialists. Since World War II, efforts have been made to develop selection tests or techniques for aircrewmembers which would assure minimum losses during training and maximum effectiveness in the operational setting following the training period. These efforts continue.

Information from accident records, training grades, and instructor evaluations of student aviator performance is used to ascertain the ideal training product. Screening applicants for these ideal characteristics ensures a student aviator pool directed to the appropriate pipeline. In peacetime, the number of graduates needed decreases, so the training command can be more selective. We are currently

In last month's article, Drs. Alkov and Shannon identified the five P's of human factors (physical, physiological, psychological, psychosocial, and pathological) and their relation to aviation safety. The conclusion was that there is a need for a change in our safety philosophy because human error rates are remaining relatively stable while costs per mishap are consistently increasing. The following article discusses how we currently deal with human factors, and makes recommendations for renewed efforts in solving the problem of human error.

AIRCRAFT ACCIDENT PREVENTION

in such a period of reduced training output.

Research at the Safety Center on high-accident-risk aviators is providing data on undesirable personality characteristics. These characteristics should be avoided in selecting student naval aviators and naval flight officers. Hopefully, the end product will be safer and more effective aviators.

Training. Training should not only stress proficiency with equipment, but discipline, crew coordination and communication, and teamwork. Constant practice should assure that effective and safe behavior during normal and emergency operations will be performed.

Another aspect of training is safety awareness. Safety education, one way to enhance safety awareness, is the process of broadening one's knowledge for the purpose of developing an appreciation of the importance of eliminating mishaps, and the ability to recognize and correct conditions and practices that could lead to mishaps.

Program managers should recognize that poor human factors engineering design can lead to greater training costs. Cockpits that are complex require more training effort. Lack of cockpit standardization can cause problems when transitioning from one aircraft to another. Under stress, there is a human tendency to revert back to earlier learning and habits. This can obviously lead to mishaps.

With the high operating costs of today's complex weapons systems, the simulator has come into its own. Simulation allows familiarization with systems and procedures, while duplicating the flight environment at a fraction of the operating cost and without risking lives and expensive aircraft. Coupled with the development of standardized procedures (NATOPS), improvements in flight training have accounted for a substantial portion of the overall decrease in aircraft mishap rates.

Human Factors Engineering. Human factors engineering is the application of knowledge about human capabilities and limitations to total system or equipment design and performance. In the design of new systems, the human factors engineer's contributions range from performance analysis and function allocation, through maintenance and training equipment analysis and design, to test and evaluation. Human factors engineering is involved from system conception to the final phases in the system's life cycle.

Design of equipment, controls, and workplaces can play a significant role in the causes of mishaps. For example, controls which cannot be quickly and easily reached or used and displays which are difficult to read and interpret can predispose aircrews to make errors. Also, maintenance *Murphys* are caused by designers not fully considering or designing for the possible errors that can be made by people working on equipment.

The discipline of anthropometry is the study of the human body in relation to arm reach, leg length, sitting height, etc. in order to define a population. In this case, we wish to define the population of aircrew who must be accommodated in naval aircraft. Measurements are taken to ensure physical compatibility between the user and the equipment designed for them to use or wear. These figures are then referred to in the design of new equipment or systems. Also, aircrew may be assigned to existing cockpits based on their size limitations. These steps are necessary in order to avoid anthropometric incompatibilities in naval aircraft and flight equipment.

Continued

Mishap Analysis. Lastly, the remedy of mishap analysis will be discussed. The Naval Safety Center receives and analyzes all mishap and injury reports submitted by aviation, ship, submarine, and shore units. Information derived from these reports is indexed to describe such elements as the phase of operation, material failure, personnel action, and cause factors. This information is then incorporated into a computerized data bank which provides the capability to retrieve all mishap and injury records involving a specified set of circumstances. In this way, the Naval Safety Center is able to monitor accident trends and pinpoint areas where corrective action is required.

Safety surveys also are conducted by the Naval Safety Center upon the request of a unit's commanding officer. The purpose of the survey is to identify and analyze hazards and mishap potential, and thereby determine preventive action. These surveys are performed by a team of knowledgeable officers and chief petty officers.

The Naval Safety Center also participates with system safety and human engineering working groups during design and developmental phases of new aircraft, in order to ensure that the contractor is considering safety, aircrewmen, and maintenance personnel.

The Center coordinates accident prevention education within the Naval Establishment. This goal is further enhanced through safety publications such as APPROACH, MECH, FATHOM, and LIFELINE Magazines, Crossfeed, Weekly Summary, and Ships Safety Bulletin.

Recommendations. In summary, the Navy, faced with the problem of human error mishaps, has developed a variety of integrated efforts to curtail this problem. The general improvement of the entire system through astute, integrated management has resulted in a marked reduction in such occurrences over the years, and has decreased the loss in terms of manpower, equipment, money, and time. However, this program may not be adequate to further decrease human error mishaps. What is needed, first of all, is an effort at all organizational levels to probe into the deeper causes of these mishaps, rather than just describing observable behavior. Hopefully, this will lead to a better understanding of the problem, and a lessening of its occurrence.

The effects of mechanical and environmental conditions upon human performance must be stressed. Man should be studied as an integral part of the whole man-machine-environment system and taken into consideration in aircraft and equipment design.

Finally, an emphasis on the positive, rather than only looking at the negative results of a safety program, should be pursued. Severity and frequency of mishaps stress the negative, while safety lectures, FOD walkdowns, good quality control, effective maintenance monitoring, etc. are examples of positive accident prevention efforts. Safety records within the organization should indicate not only mishaps or a lack thereof, but the occurrence of activities to prevent mishaps. With these steps, we might see a further decrease in the pervasive problem of human error in naval aviation mishaps.

RED LENS NEMESIS

By LCDR Peter G. Buletza
VAQ-130

ONE thing that can be a nemesis to aircrews, whether they're intrinsically awkward (should I say clumsy) or not, is that red lens companion of the trusty gooseneck flashlight. Most of us have already figured out that if you take the bottom cap, which houses the spare white and clear lenses (which we don't use anyway,) off and discard it, the red lens and top cap can be screwed onto the bottom of the flashlight body, a nice place to keep it until your white light preflight at night is complete. But how many of us can successfully screw the red lens cap back onto the top consistently without popping the red lens out onto the deck or into the cockpit?

Recently two red lenses were found under a pilot's ejection seat next to control cables. One was intact; the other bent up a good bit. When the previous pilot who had flown the aircraft was asked if he had noticed any control difficulties, he stated, "Come to think of it, I did feel a little more than usual resistance in the stick." Thank goodness for eagle-eyed plane captains!

There's a simple remedy to ensure this situation doesn't happen again. Just take a little Type I, Class II adhesive, FSN 8040-00-826-3535 (your rigger probably has some) and apply very sparingly to the edges of the red lens. Then place the lens into the upper adapter cap. Even if your aircraft doesn't have control cables running under your ejection seat, FOD in the cockpit is something we can all do without.

FAA tests new takeoff clearance system

THE FAA's National Aviation Facilities Experimental Center started a 6-month feasibility demonstration on September 18 at Bradley International Airport, Windsor Locks, Connecticut, of a new experimental runway traffic light system designed to give airplanes about to take off added protection from collisions with other aircraft.

The national test center, together with FAA's New England Region, has installed the new system at Bradley International as part of a research and development effort by the Federal Aviation Administration to devise further safety measures that might be needed to prevent airport runway accidents. Commercial and military pilots using Bradley have pledged to cooperate with the evaluation, and the FAA is currently seeking participation by private pilots.

At present, controllers in airport towers direct runway traffic by radio contact with aircraft on the ground. The new, experimental system would be a visual confirmation, through green lights, of their verbal clearance to take off. It would be the first use of such traffic lights at a regular airport in the nation.

NAFEC Acting Director Joseph M. Del Balzo said the reactions of both pilots and controllers to the Bradley tests would be vital in determining not only the acceptance of the new traffic lights, but the scope and dimension any such system should take in the future.

The Visual Confirmation of Voice Takeoff Clearance System, dubbed VICON for short, is designed to prevent aircraft collisions on the ground such as the one that occurred March 22, 1977, when two Boeing 747s collided at the airport on Tenerife Island, killing more than 570 people. The probable cause has been attributed to a verbal misunderstanding of takeoff clearance.

The new system consists of clusters of three pulsing green lights located at all takeoff positions along the left side of runways. Mounted on 14-inch-high, frangible tubes, one or more of the lights will always be visible to pilots of aircraft on the runway or on a taxiway approaching the runway.

Here's how the system works: When a controller clears a pilot for takeoff, he will push a button on an airport tower control panel that will turn on the appropriate lights. If the pilot, awaiting takeoff, does not see the lights, he is expected to check back with the controller.

In some positions, the lights will be turned off as the departing aircraft breaks an electronic beam across the runway. The remaining lights will be turned off by timers after approximately 30 seconds. The timing can be adjusted as desired to meet different traffic conditions.

NAFEC designed, developed, and fabricated the new system. It also conducted initial testing at the NAFEC/Atlantic City Airport, which is located within the 5000-acre experimental center, 10 miles northwest of Atlantic City. The operational evaluation at Bradley International is being done by NAFEC for the FAA's Air Traffic Service.

In the forthcoming evaluation, FAA will ask participating pilots to complete preaddressed, postage-paid questionnaires. They will be available from the Bradley Flight Service Station and from fixed-base operators at Bradley and nearby airports. They also should be available at airline dispatch offices, or can be obtained by writing Project Office (VICON), ANA-210, FAA/NAFEC, Atlantic City, NJ 08405.

Anymouse

Lip Service

WHAT'S wrong with the safety program? Well, I'll tell you. I've been a safety PO for several months, and sitting in on meetings, I hear the same problems, the same discrepancies, and the same personnel involved. Action taken? *None!* I'm sick and tired of hearing excuses of why we can't get the job done. More excuses! The reason being because no one (upper ranks) is really concerned. They just want the word "safety" put out to the men so that it may be logged that they heard about it. I can't believe that with a ship this size, operating on the budget that we operate on, that we can't incorporate needed changes.

Areas on the flight deck, particularly aft, need nonskidding This has been a gripe since deployment. There has been very little action taken. There again – excuses! If we can operate, we can take care of some of these problems, even if it means nonskidding those same areas we've nonskidded before. (Aft of the island there is practically none, or it is bare.) There is no excuse for this condition. I like to fly, but I don't like to fly in unsafe conditions which can be corrected.

We only react when we become faced with an accident that probably could have been prevented. How can we tell the crew to do something that the staff seems to care very little about? When there are no actions taken, there is no reaction. We've got to start using a little more "can-do," or we're never going to see the end of our problems. We're defeating our own purpose! Shouldn't we let everyone in on what we're doing?

On the ship, if we don't act now, there may not be a second chance. Let's get our act together and show that we can operate 100 percent accident-free. If it's going to happen, let it be the manufacturer's fault.

I asked a simple question. Where is my lifevest located in case of abandon ship? So far no one knows! The ship has yet to come out with a publication stating whether or not there are any. Yet we continue to talk safety. Let's get our act together now! Start today; at least it's a start. We may kill ourselves before we finish, but we did start.

Fightingmadmouse

Watchword

THE setting is an NAS, and the aircraft is the Navy's newest P-3. The weather is nasty in rain showers, but the aircraft taxies out for takeoff and experiences a pitot heater failure. The pilot returns to the line for

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous **situations. They are submitted** by Naval and Marine Corps aviation personnel who have had **hazardous or unsafe aviation experiences.** These reports need not be signed. Self-mailing forms **for writing Anymouse** Reports are available in readyrooms and line shacks. All reports are **considered for appropriate** action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

troubleshooting. The pitot heater proves to be bad, and the pitot tube is replaced.

The pilot is advised that an 80- and 100-knot check prior to rotation is sufficient to check the integrity of the system. The aircraft is released with an unsigned discrepancy against the pitot heat. The aircraft departed and completed its mission without mishap.

As a QAR, I would never have known that this chain of events happened, had the copilot of this flight not come forward and questioned the whole thing after the flight. Investigating this whole mess, it occurred to me that this procedure had taken place on three other occasions, with a since-departed maintenance officer's approval.

At this point, I can only say that God must keep an eye on imbeciles, drunks, and aviators. I will spend the better part of the remainder of my tour here keeping my eye on everyone.

WatchfulQARmouse

Turnup Close Call

IT was midafternoon on a clear day, and only a handful of personnel remained at the NAS while the rest of the squadron left on a weapons detachment. One of the squadron aircraft required a turnup to verify and correct a fuel leak gripe, to make it ready to fulfill one of the detachment's requirements. A qualified ground turnup man was assigned to perform the maintenance turn.

The preturn check was accomplished, but he failed to note brake accumulator pressure, lack of tiedown chains, and only the port wheel being chocked. Although all these safety discrepancies were present, the turn of No. 2 engine proceeded normally. As the throttle was advanced to idle, the aircraft began to move around its port mainmount. Brakes were applied with negligible results (due to low brake accumulator pressure). Immediately, the starboard engine was secured and the aircraft came to rest after pivoting 120 degrees from its initial starting point, just 10 feet from another aircraft parked on the ramp. Fortunately, the only damage that occurred was the attached electrical power cable being torn from the stationary power console.

There is no substitute for adherence to published safety procedures concerning both low- and high-power ground turnups at shore facilities. This ground incident was the product of inattention to detail and inordinate haste.

Chastenedmouse

Watch Your Foot

WHILE wingwalking an SH-3 into a tight parking place in the hangar, subject mouse suddenly found himself trapped between some main rotor blade containers and the oncoming SH-3.

The result was one SH-3 tire on top of a foot which was, fortunately, covered by a steel toe. While embarrassing, the incident was not painful, but heads-up is required on all aircraft evolutions, and STEEL TOES SAVE FEET.

Clumsymouse

Falcon 101

TWO helicopters on this LPH were conducting some two-plane form work over the island. Dash 2 got too close and caused an intermeshing of the rotor blades. The resulting midair caused such severe vibrations that

Dash 1 couldn't even transmit his Mayday. He landed ashore and was able to walk away. Dash 2 got word back to base, and new rotor blades were dispatched to the damaged helo. They were installed in the field with only a superficial inspection of the airframe.

The aircraft were then flown back to base. Upon arrival, the crews were ordered to fly the birds back to the ship!

None of the maintenance inspections required by OPNAV instructions were accomplished, nor was common sense used. The HAC started the aircraft and flew it back to the ship, at night, obviously over water. Concern for the crew? The only three items missing from this occurrence were supervision, common sense, and the accident/incident report! There is more to this story than meets the eye.

Unbelievablemouse

To land or not

ON a routine, roundrobin MedEvac flight in the Med, I was faced with a problem that was somewhat unique, at least in my aviation career.

As is usual in many MedEvac flights, short notice prevailed. At 2230 I was told that I needed to launch at 0430 the next morning for a 3-hour flight to a civilian field on Sardinia. I was to pick up a litter patient and take him to Naples, where there are better medical facilities, then fly back to Sigonella.

The weather was good for this time of year (winter in the Med) with a low pressure centered over Genoa and associated weather bands extending south to Sardinia and through the Tyrrhenian Sea. I read the NOTAMs for destinations and points along the route of flight – all looked good.

Takeoff and en route weather to the first stop were as planned; typical in and out of the clouds with light ice at FL100 (the minimum en route alt, and the common Med cruising altitude for the trusty C-1A).

When we were turned over to Approach Control at Olbia (Costa Smerlda), we were given the standard weather information. However, the winds were 10 knots greater than briefed and gusting even higher. This was followed by a NOTAM message (NOTAM No. A412) that Runway 24 was closed for landing until further notice, because of a large concentration of sea gulls at the approach end of the runway.

"The duty runway is 06. The wind is 300 degrees at 20 knots gusting to 25. What are your intentions?"

I asked my copilot if he had seen any NOTAMs about the runway being closed. He said he had not; I hadn't either. Since the quartering tailwind component was marginal at best (C1 NATOPS doesn't give any gouge on tailwind landings, and limits crosswind landings due to nosewheel speed of 115 knots), I asked Approach Control if it was at all possible to utilize Runway 24 for landing. We were advised that the NOTAM prohibited landing on Runway 24.

We commenced the published VOR approach for Runway 24, and the wind was extremely gusty out of 300 degrees. As we came over the approach end of 24, for our left-hand circling approach for Runway 6, we could see a large concentration of sea gulls on the ground, in the sanitary landfill at the end of the runway.

We completed the landing checklist, going upwind to Runway 6, and planned an extended, wide 180-degree position to compensate for the wind, which we knew would blow us toward the runway in a hurry. I reduced power to 15 inches and turned sharply to 30 degrees angle-of-bank. However, when we rolled out on final we were almost over the numbers and still at 300 feet, with the airspeed indicators bouncing ± 10 knots. I took it around, knowing there was no way I could land from that position.

We climbed back up to 1000 feet and asked again several times if we could use Runway 24, with the pilot taking full responsibility. Again, the answer from Approach Control was a negative. I discussed with my copilot our mission to pick up the litter patient, and we decided between us that

to land...

By LCDR Dan C. Archer
ASO/VR-24

I would try one more approach with even a wider and longer 180-degree position. If we didn't make it this time, we would proceed to our alternate. We set up for a two-thirds flap approach and flew upwind almost 2 miles, about 1 mile abeam, turned off the 180 degree, and powered back to 15 inches. The wind blew us quickly to the runway, but this time we were only 75 to 100 feet over the approach lights. The wind was gusting 20-30 knots from 300 degrees, and I had to use full left aileron to keep the nose lined up on centerline. I touched down and immediately put the nosewheel on the runway, and kept in full left aileron. The wind still tried to pull the left wing up, but we were safely on the deck. The rest of the flight to Naples and Sigonella was uneventful.

Later, back in Sigonella, we found out that NOTAM No. A412 (an Italian NOTAM) was in our base operations, underneath the NOTAMs for another airfield, and consequently we hadn't found it. The American NOTAMs didn't include the runway closure.

This incident showed me how difficult a decision could become when you have just a few cards stacked against you. Fortunately, this experience helped remedy some problems in our NOTAM system and, hopefully, will help our squadron better plan their future flights. ◄

WIND

ON June 24, 1975, a Boeing 727 airliner crashed into the approach lights of Runway 22L at the John F. Kennedy International Airport. The aircraft was on an ILS approach to the runway, through a very strong thunderstorm located astride the ILS localizer course. Of the 124 persons aboard, 113 died of injuries. The aircraft was destroyed by impact and fire.

The National Transportation Safety Board determined that wind shear was the major cause of this accident. In fact, according to the NTSB, "It is probable that the wind shear might have been too severe for a successful approach and landing had the crew relied upon and responded rapidly to the indications of their flight instruments."

This tragedy is one of many, over the past decade, in which evidence has indicated wind shear was the primary cause.

Severe wind shear is certainly associated with thunderstorms or other severe meteorological phenomenon but can also exist in clear weather. Frontal passage, airport terrain, and topography can also set the conditions for wind shear to exist.

The effects of wind shear on an aircraft are complex and can affect it in many ways. When flying a cross-country flight, it is likely that your aircraft will encounter several wind shear areas that are present between the many different air masses around the earth. Some turbulence may be encountered, even moderate to severe at times, but the altitude and airspeed are such that the airplane can be safely maneuvered through it. However, when your aircraft is in a high drag, landing configuration with lower airspeeds and altitudes, little altitude is available for recovery, and stall margins are at their lowest. This is the most critical situation in which to encounter wind shear. If the wind shear is severe enough, the best pilot will not be able to cope with it using his best skills and the maximum performance of his aircraft. Therefore, the discussion will center around low level wind shear or wind shear encountered during an instrument approach.

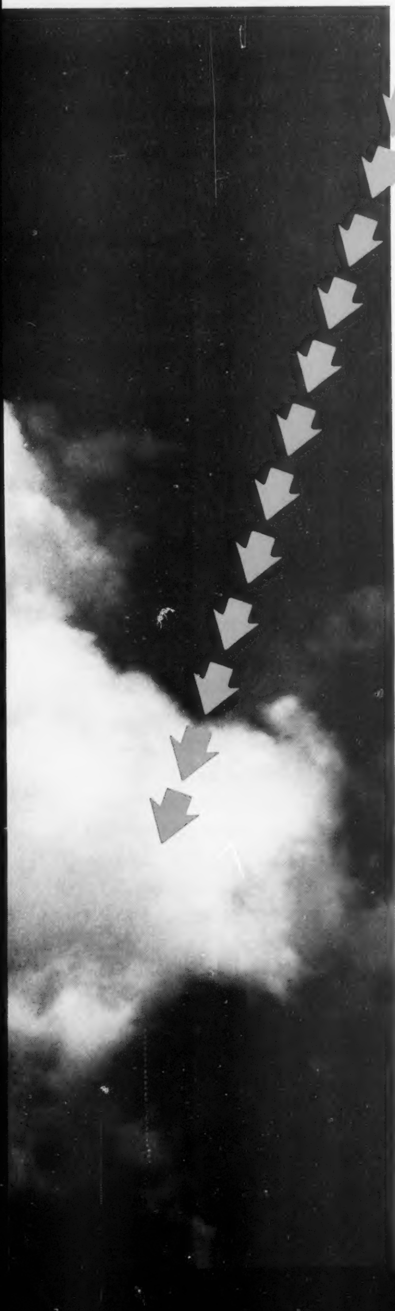
First of all, consider an aircraft flying a typical ILS approach or GCA on a fixed flight path related to a specific point on the ground. Let's assume we have a headwind of some steady magnitude and, at some point, it drops to zero or calm. While in the headwind, indicated airspeed, ground speed, and lift are constant. As the aircraft enters the shear area, indicated airspeed will decrease by the equivalent amount of headwind decrease, and a significant loss of lift will occur as the airflow over the wings decreases (angle-of-attack remains constant). Since the aircraft's gross weight has not changed, lift is no longer equal to gross weight. The aircraft will accelerate towards the unbalance, or go down. An increasing tailwind will produce the same effect.

Normally, in the above case, the aircraft will pitch down and accelerate to equilibrium. However, due to its proximity to the ground, the pilot must react instantly with increased thrust and angle-of-attack to prevent a disaster. This case is particularly dangerous because, within seconds, the aircraft is short of airspeed, in a high drag configuration, and at a high angle-of-attack. Also, the engines are at a low thrust or horsepower setting. Pilot reaction time and the ability of the engines to develop thrust in a short period of time are critical. If sufficient time to regain the proper airspeed and glide slope is available, thrust must be reduced after recovery to a value less than was originally set before entering the shear. With a 3-degree glide slope, less power is required in a no-wind or tailwind condition than for a headwind condition. If the power adjustment is not made, an excess power/airspeed condition will result and you will end up high and fast, and stopping within the available runway length may be impossible (see Fig. 1).

Let's consider now the opposite case – an aircraft encountering an increasing headwind or a decreasing tailwind. As the aircraft enters the shear area, the indicated airspeed and lift will increase. The aircraft will have a noticeable increase in performance. The aircraft will

SHEAR

By LT Byron Fisher
ASO VP-45



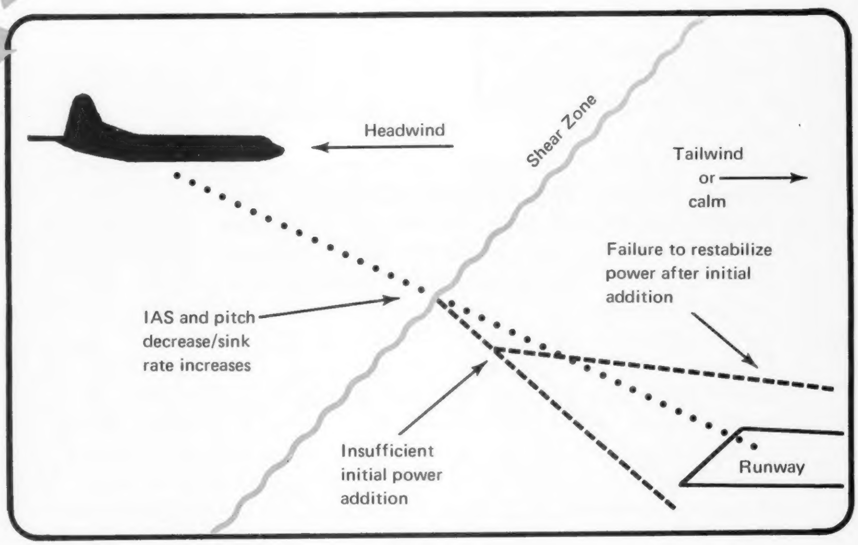
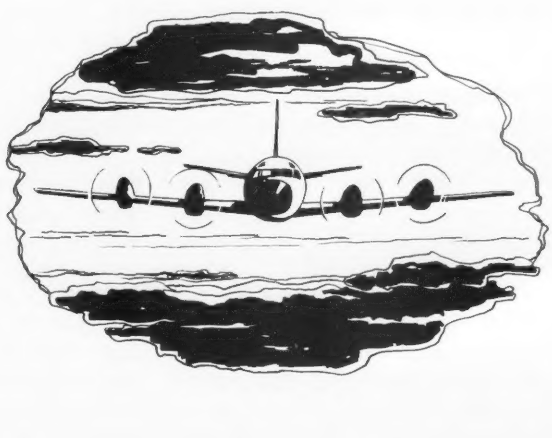


Fig. 1



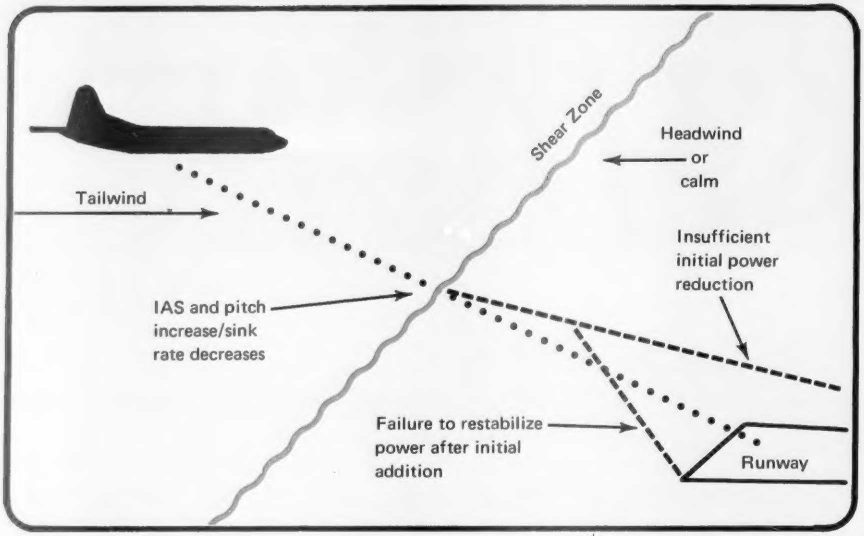


Fig. 2

naturally pitch up and go above the glide slope as it seeks equilibrium, due to lift being more than the gross weight. The pilot must react with forward stick and a reduction of thrust to get back on the glide slope. After the aircraft reaches equilibrium, the pilot must add thrust and adjust the angle-of-attack to restabilize in the new headwind condition. Failure to restabilize after the initial power reduction will result in a high sink rate and a short, hard landing (see Fig. 2).

The above two cases involve a wind shear in the horizontal plane and only at one level. It is likely that things may not be this simple. Vertical wind shear may also exist, and the shear areas may be present at several layers on the approach. Combine all of the above with IFR weather and with the element of surprise (because all of this may be unanticipated), and the pilot will have his hands full.

The NTSB concluded that other significant factors that must be considered include the aircraft's approach speed or entry speed, its configuration, and its flight characteristics under such conditions. Increasing your approach speed will aerodynamically reduce the effect of wind shear on your aircraft. For example, a large aircraft such as a P-3 which encounters a wind shear at 150 knots IAS will experience less loss of lift and will develop a lower initial descent rate than an identical P-3 which encounters the same condition at 140 knots IAS. The extra knots carried on the approach will allow you to stop the rate of descent imposed on the aircraft quicker, with lower control forces, and with less additional thrust. A smaller aircraft with less wing loading will be less affected, and nearer to normal approach speeds may be used.

Pilot awareness is of paramount importance. Any deviations from normal power settings may confirm that a wind shear exists. For example, on an ILS or GCA approach, higher than normal power settings and pitch attitudes indicate that a headwind component exists. Lower pitch attitudes and reduced power settings indicate a tailwind component exists.

The VSI (vertical speed indicator) is very useful in determining headwind or tailwind components. Determination of the glide slope angle and predicted groundspeed for a given precision approach will give you an expected rate of descent. If your actual rate of descent is higher than normal, a tailwind exists since your actual groundspeed is higher than predicted. The opposite case is that a lower actual rate of descent indicates the presence of a headwind component, as your groundspeed will be less than predicted.

If your aircraft is equipped with an Inertial Navigation System, you should make use of the wind, groundspeed, and drift angle readouts. During the descent, compare the INS wind information with the tower reported winds. If the winds are generally from the same direction and speed, chances are that there is no wind shear. If, for example, there are significant variations between the INS winds at 2000 feet and the tower reported surface winds, expect a wind shear on the approach. While flying a constant indicated airspeed, variations in groundspeed and drift angle will also confirm the presence of wind shear. Remember that INS winds are in degrees true, and the tower reported winds are in degrees magnetic. The local variation must be applied to the INS winds.

Pilot reports are very helpful. If you encounter wind

shear on the approach, report it to the tower so that a pilot behind you may be made aware of the situation. A pilot in front of you may someday be of assistance to you.

Finally, you should know the latest weather conditions and local topography of your destination airport. A recent frontal passage or a nearby thunderstorm indicates that there may be wind shear. Island airports or airports in mountainous terrain may have a wind shear in clear weather. At many locations, the tower will report wind direction and speed at three points on the runway: touchdown zone; runway midpoint; and runway end. If the wind directions and speeds are generally the same, then there is no problem. However, if variations exist, expect a wind shear. Many P-3 deployment sites have the conditions for wind shear to exist at any time.

Flight station preparation and crew coordination are essential. Familiarity with the entire approach procedure and with your aircraft performance are very important in order that deviations from the norm can be immediately detected and appropriate adjustments made. It may be necessary to fly the approach 10 to 20 knots above the normal approach speed, depending on the intensity of the shear. The use of less than full flap settings will result in decreased drag and better controllability in the shear areas.

Knowledge of the runway length and condition is important. A wet, icy, or snow-covered runway will result in poor to nil braking action. The conditions may be such that stopping within the available runway length is impossible when using faster than normal approach speeds. If there is any doubt that a safe approach and landing can be made, two options exist: hold until weather conditions improve (fuel permitting); or go to your alternate.

In summary, steady winds have little effect on aircraft performance, except for constant influence on groundspeed and drift angle. Abrupt wind changes affect an aircraft aerodynamically. An approach or landing into an increasing headwind component *increases* aircraft performance, while an approach or landing into a decreasing headwind component *decreases* aircraft performance. A wind shear condition that leaves you short of airspeed and close to the ground can be disastrous. Faster approach speeds will result in less loss of lift and better controllability. If more thrust is needed, add it quickly. Be more conscious of the rate of information available from the glide slope or GCA controller, altimeters, rate-of-climb indicators, and angle-of-attack indicators. Also, include your power gages in your instrument scan. Ensure that one pilot stays on instruments until adequate visual cues are present to conduct a safe landing. Make a careful evaluation of all factors. If any doubt exists, execute a missed approach.

HELICOPTER AIRBORNE RADAR APPROACHES

ENGINEERS and pilots at FAA's NAFEC (National Aviation Facilities Experimental Center) have collected flight data on over 70 airborne radar approaches to onshore and offshore sites that will be used to aid the Federal Aviation Administration in developing standard approach procedures for helicopters operating under Instrument Flight Rule conditions.

All flights were made in the Center's Sikorsky CH-53A helicopter, equipped with a Bendix RDR-1400A weather radar, to landing sites equipped with one or more radar beacon transponders that served as approach aids.

NAFEC plans call for an additional series of approaches using an RCA Corporation Primus 50 weather radar which has a combined beacon and ground mapping mode. The purpose of these tests is to determine if the addition of ground mapping capability improves the helicopter's navigation accuracy.

The airborne radar approach project is one of five major parts of FAA's Helicopter IFR Operations Program being conducted at NAFEC. The new FAA program, a major one, is designed to establish the standards and procedures needed by the rapidly growing number of helicopter operators desiring to operate under Instrument Flight Rule conditions within the national airspace system.

The other major parts of the program being conducted at NAFEC involve offshore operations, Northeast Corridor operations, terminal instrument procedures, and helicopter use of microwave landing systems.

Courtesy Public Affairs Office
FAA/NAFEC
Atlantic City, NJ

Whose GCA was it?

By LCDR Frank A. Miley
VAW-117

SEVERAL years ago, while I was returning to homefield from a long cross-country flight, I experienced one of those kinds of incidents that caused weak knees a couple of hours after the actual event.

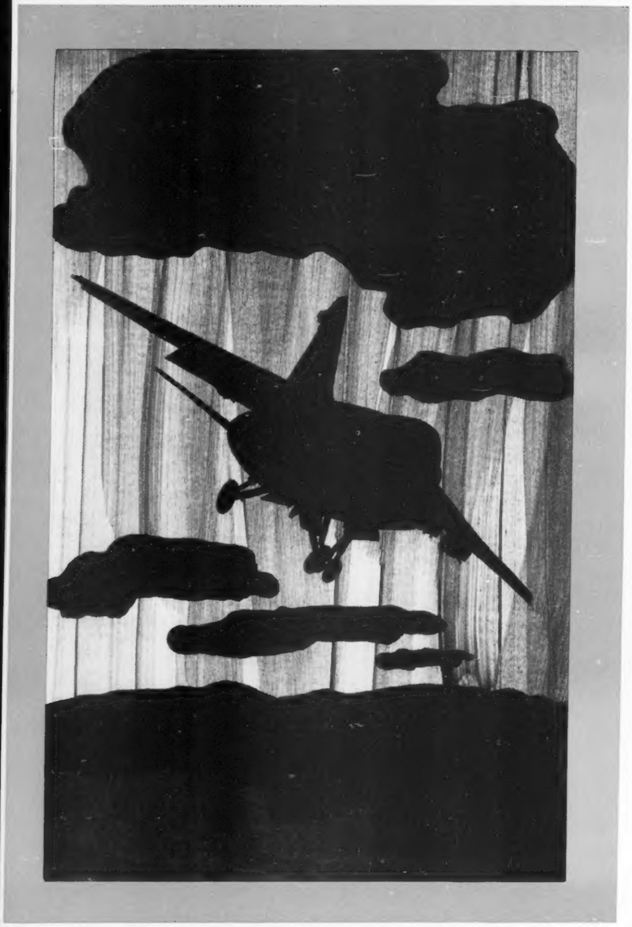
It was after midnight and I was tired. The weather was 300 overcast, and visibility was 3 miles in light rain. I elected to fly a GCA. A PAR sure helps to fill in that dark hole in space. Aside from being tired, I also suffered from some amount of complacency. I had flown many GCAs at this field in this aircraft, and I, like many others, assumed that "Big Brother" radar was taking good care of me.

After I had turned final and dirtied up, I settled down to just keeping the aircraft on heading and glide slope. I was very proud of myself. I stayed on glide slope most of the way down, and heading corrections stayed within 2 to 3 degrees.

I should have suspected something was amiss when I crossed the threshold lights without the final controller ever mentioning it. As a matter of fact, he did not even tell me when I was approaching minimums. After I landed and was rolling out, I could still hear the final controller giving me glide slope information! That blip on the radar was now on glide slope at 1 mile! I realized that GCA was talking to me, but actually following another aircraft on glide slope. This really bothered me, and I must admit I found it rather hard to imagine it could happen. I later found out that another controller was directing the aircraft behind me on another frequency, so he was okay. The pilot sure flew a nice GCA.

This incident should never have happened. The field had a TACAN located 1 mile from the touchdown zone and used a 3-degree glide slope. A typical 3-degree glide slope descends 318 feet for every nautical mile. When the GCA controller said I was at 5 miles from touchdown, my DME would be reading 6 nm. That means that for every mile I must lose approximately 300 feet (the figures for a 2.5-degree glide slope are similar).

The GCA at this field called for 1500 feet MSL at 5 miles (6 DME) from touchdown, and this was the point to commence descent. Had I been more alert, I would have checked my altimeters every mile (at 4 miles from touchdown (5 DME), I should have been at 1200 feet MSL). The rest is easy to compute: 4 DME = 900 feet; 3 DME = 600 feet; 2 DME = 300 feet, and I would be touching down at 1 DME. Most Navy fields are set up in this fashion, with



a TACAN at either end of a duty runway. A good preflight of the approach plates will bring this out.

Now a little food for thought for the real professional. Let me go back to the 3-degree glide slope, which requires a 318-foot-per-mile descent. In order to remain on such a glide slope, it requires the following descent rates at the depicted groundspeeds:

Groundspeed	Rate of Descent
250	1326 feet per minute
200	1061 feet per minute
180	955 feet per minute
150	796 feet per minute
120	636 feet per minute
100	530 feet per minute

Having a groundspeed readout all the way to touchdown can certainly be valuable to you. However, if you don't, the VSI can be a good clue to what your groundspeed is. If you require an extraordinarily high rate of descent to maintain glide slope, you probably have a tailwind, or your gear is up. Close attention to the reported surface wind could indicate a wind shear. For example, the GCA controller is reporting a 10-knot headwind, but your VSI tells you that you have a tailwind. This situation can be dangerous and cause you to land short, especially if you stop listening to the GCA controller's glide slope information.

A quick gouge for computing the required rate of descent for a 3-degree glide slope would be to take one-half the groundspeed times 10, i.e., GS 120 x ½ = 60; 60 x 10 = 600 fpm. Using this gouge in reverse, you can use the VSI reading to compute your groundspeed. For example: A rate of descent of 700 fpm = 140 kt groundspeed (700 ÷ 10 x 2 = 140).

Under a radar environment it behooves all of us to know where we are at all times! I don't mean to imply that you shouldn't listen to the GCA controller, just know where you are. Too many mishaps have been caused by the pilot failing to fly the needles on an ILS/ACLS approach, or not paying attention to the glide slope information. This is especially true when the pilot has spotted the runway environment at a relatively low altitude and ignores the glide slope information being offered to him.

The ability to visually discern a 2.5-degree or 3-degree glidepath can be seriously affected by terrain, runway slope, visibility, and lighting. An upslope in the runway or the approach zone will create an illusion of being high, thereby causing the pilot to increase his rate of descent. A downslope creates the opposite illusion. Haze, smoke, glare, or darkness may make you appear closer, while dim lights make you appear farther away.

Had I used any of this knowledge properly, I am sure I could have been able to go home and go to sleep right away, instead of staring into the darkness wondering what rate of descent I really used, and what azimuth corrections I really followed to get me on the runway that night.

BRAVO ZULU

LCDR Bob Ferver

ON 19 February 1979, LCDR Bob Ferver launched from the USS MIDWAY (CV 41) in an A-7E to conduct a Functional Checkflight. All engine indications and portions of the flight were normal through the 30,000 feet engine checks. While LCDR Ferver was climbing his aircraft through 35,000 feet, to conduct the 40,000 feet checks, he noticed a flashing Master Caution light. Inspection of the Caution Panel revealed that the ENG OIL light was illuminated. LCDR Ferver checked the oil pressure and found it to be normal. However, when he checked the oil quantity gage, he found it to be indicating one-half. Total flight time to this point was 25 minutes. The aircraft was positioned overhead the ship, above a broken cloud layer.

LCDR Ferver analyzed the situation, set the power at 82 percent, deployed the EPP, and requested an immediate landing (which was available since the MIDWAY was recovering aircraft). Because of the cloud layer and lack of an operating TACAN, LCDR Ferver was given vectors for a VFR approach to the ship.

At 8000 feet, LCDR Ferver visually acquired the carrier and set up for a circling approach. At this time, he noticed that the oil quantity was indicating LOW. LCDR Ferver arrived 5 miles behind the ship at 300 knots. He S-turned his aircraft to slow down and, at 1½ miles, lowered the gear. Some power adjustments were required to arrive on glidepath. During the approach, the oil quantity remained at LOW and the oil pressure remained within limits. Although not ideally set up for a carrier approach, LCDR Ferver successfully landed his aircraft on the first pass. Postflight inspection revealed that oil was leaking from an engine bearing and enough oil was available for less than 5 minutes of additional flight.

LCDR Ferver's positive action, professional attitude, and superb airmanship under an emergency situation prevented a major mishap and saved a valuable aircraft.

Bombs [and fuel tanks] away!

THERE have been quite a few red-faced pilots who haven't released ordnance on bombing runs, but instead, have dropped fuel tanks. The incident messages have included the expected phrases *pilot error, inadequate knowledge of the ACP* (Armament Control Panel), *poor headwork, poor judgment, improperly configured ACP,* and *complacency.*

One aircraft was conducting a simulated mining exercise. The aircraft was configured with two AERO-1D fuel tanks and had FTK set into the weapons load indicators for stations 5 and 6. The pilot believed that this ACP configuration prevented normal release of wing stores through the ACP. He desired to provide an accurate training evolution and directed the copilot to follow the standard sequence for an off-line release.

A white sequence light was displayed on the ACP for wing station 6, and the pilot selected the switch to ARM. He saw the amber light come on, indicating all prerequisites were satisfied for an off-line release. The pilot depressed the stores release button and saw the starboard drop tank release. The pilot, in his ignorance, assumed that the ACP interlock feature existed. The act of completing the release sequence, with no intention to drop a store, was poor headwork.

After the incident, the ASO questioned many pilots, both within and outside of the command (including one NAMTRADET instructor), concerning their understanding of the weapons load indicator function of the ACP. He received a wide variance in knowledge as to whether an ACP·interlock feature, which would prevent an on-line or off-line release of a wing store, exists with FTK dialed into the indicator. Does the information contained in the Weapons System Manual need correction?

The day after this incident, a similar boo-boo occurred halfway around the world. The pilot was airborne on a combination surveillance and bombing flight.

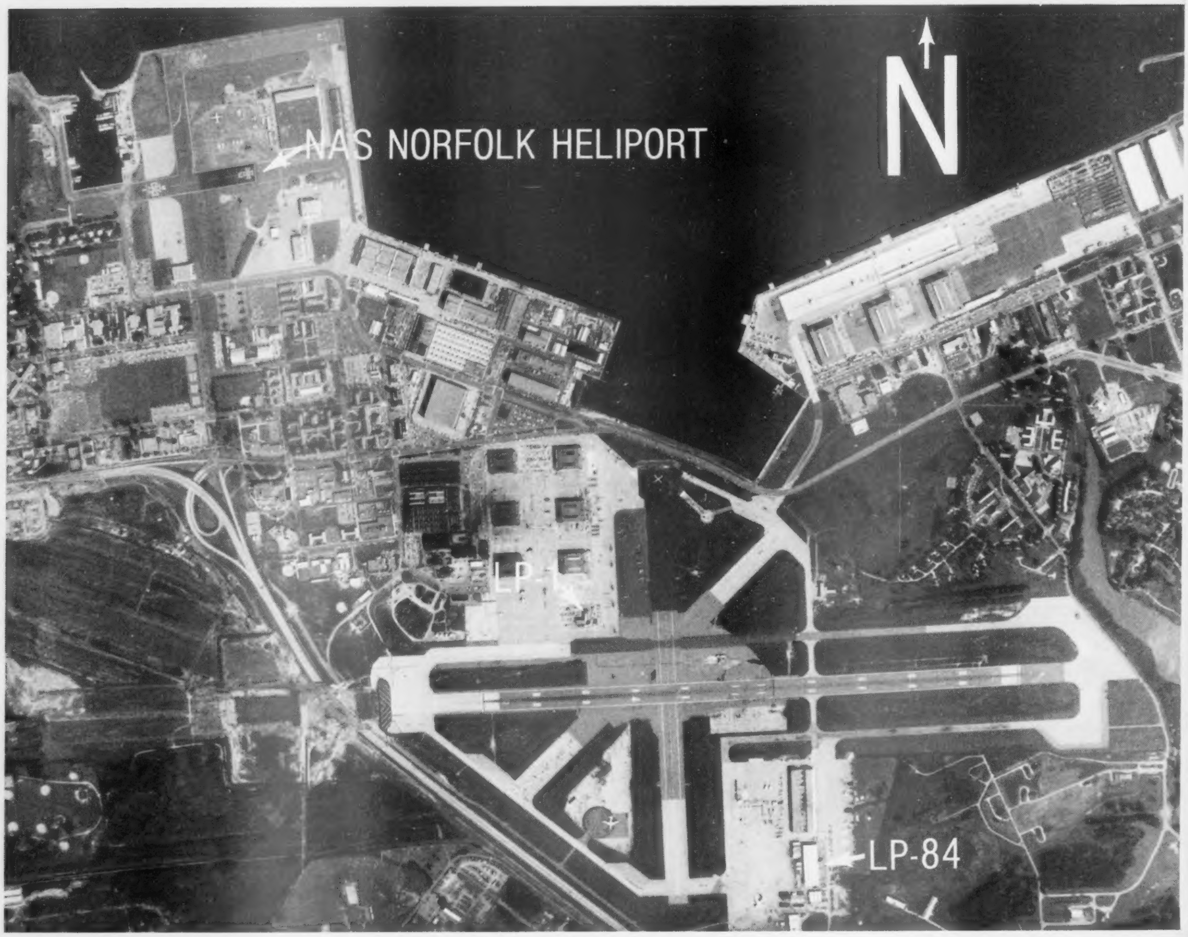
From the time of the brief until the aircraft was launched, the composition of the flightcrew was changed three times. The final pilot was given a cursory brief and he then hustled a preflight on the aircraft. It was configured with two AERO-1Ds on wing stations 1 and 6. Four Mk-76s were loaded internally.

After completing the surveillance portion, the pilot was assigned a clear area for bomb drops. The crew cleared the area to ensure there were no small boats in the vicinity. The pilot set up the ACP, actuated his stores release, and both drop tanks departed the aircraft. The pilot had assumed his bombs were TER-mounted. There had been no inflight brief to compensate for the lack of a preflight ordnance brief.

The needless jettisoning of the drop tanks was caused by an abundance of complacency, matched measure-for-measure by scarcity of headwork. Although this problem had recently been reviewed at an APM, the incident occurred anyway. While circumstances surrounding this incident call attention to specific areas requiring remedial action in weapons delivery ground training, an indifference or disregard by pilots will negate this training.

The repetition of various types of accidents and incidents indicates that mere dissemination and discussion of the circumstances fails to eradicate a false sense of invulnerability. The best way to avoid these embarrassing incidents is to know where your stores are, know what the ACP will do, and then doublecheck the switches to ensure you are going to drop only what you want when you press the release button.

NAS Norfolk (NGU)



Overhead NAS Norfolk

NAS NORVA, as it's commonly called, is the "hub" of the Atlantic Fleet's air arm. To watch the various types of aircraft transit this east coast air station leaves little wonder as to why it can be referred to as the "hub." On a daily basis, aircraft ranging from the giant C-5A *Galaxy* to the supersonic F-14 *Tomcat* to the versatile UH-1N *Huey* and, not to forget, the civilian contracted, antiquated, yet still useful C-45 (SNB) *Bugsmasher,* land and depart the NAS Norfolk complex in support of ongoing Fleet requirements. This airfield is here to stay. At present, NAS Norfolk is undergoing a major facelift that will transpose the existing facilities into a multimillion-dollar "like new" airfield by 1981; a change that aircrews will greatly appreciate. A longer runway, new lighting systems,

and better approach aids are sure to be appreciated by all who transit along the east coast. Until then, APPROACH would like to keep you abreast on just what NAS Norfolk has to offer. Save this issue and, in the fall of 1981, you'll be able to compare the "old" with the "new" NGU!

The Airfield. NAS Norfolk includes the main airfield (Chambers Field), NAS Norfolk Heliport, and the CINCLANTFLT Helipad. Chambers Field is a category "C" airfield operating 24 hours a day, serving tenant and transient rotary- and fixed-wing aircraft. The Heliport is a rotary-wing airfield serving tenant helicopter aircraft stationed aboard NAS Norfolk. The Helipad serves transient helicopters at the CINCLANTFLT complex. Airspace for the three landing areas is 5 nm up to, but not including, 2000 AGL. The main airfield is 15 feet MSL at coordinates 36°56'14"N and 76°17'26"W located on the south side of the Chesapeake Bay. The Heliport is 11 feet MSL and the Helipad 22 feet MSL.

Runways. The primary runway at Chambers Field is 10/28, consisting of a concrete/asphalt surface of 7250 x 200 feet for takeoff and 6250 x 200 feet for landing (the 1000 feet less is allowance for minimum landing obstruction clearance). Chambers has a north/south runway (1/19) which provides 4350 x 250 feet for landing and takeoff. All taxiways at Chambers are 75 feet wide, except in the Breezy Point area (northeast portion) where they are 100 feet wide. The taxiway in front (west) of the crash/fire crew building at midfield is closed to aircraft traffic. Runway 10/28 is equipped with both E-28 and E5-1 abort/arresting gear. Only E-28 gear is available on Runway 1/19. All runways and taxiways are lighted and have distance markers 1000 feet apart. Restrictions for weight, obstruction clearance, etc. can be found in the *IFR Enroute Supplement.* There is a 3-bar VASI installed on the right side of Runway 28 and the left side of Runway 10 with an OLS on Runway 19.

NAS Norfolk Heliport is located 1 nm northwest of Chambers Field within the confines of the naval air station. It has two parallel runways, 9R/27L (old runway) consisting of 1135 x 180 feet of asphalt and 9L/27R (new runway) which is 1560 x 150 feet of asphalt. The north/south taxiway is 180 feet wide and both runways and taxiways are capable of supporting twin-wheel type helicopters up to 73,000 pounds. The Heliport is lighted (old runway only) but has no distance markers available. Transient helicopters will not normally utilize this facility, but rather, Chambers Field.

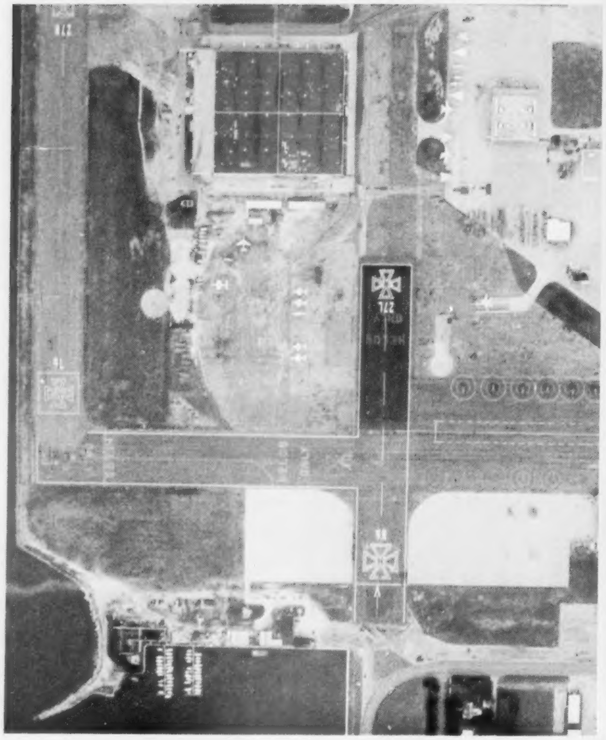
CINCLANTFLT helipad is located one-half nm southwest of Chambers Field outside the confines of the air station. Contact with Chambers Tower is required prior to use of the pad, which is 100 x 100 feet of concrete with a 100 x 90-foot asphalt parking apron. Both are capable of

handling twin-wheel type helos up to 44,000 pounds. The pad is lighted for night operations. Fifteen minutes notice is needed to set up crash crew positioning and night lighting.

Service Facilities. Hangar space at NAS Norfolk is reserved for tenant activities. However, hangar facilities for emergency repairs for fixed- and rotary-wing aircraft may be provided at Chambers Field only. Limited maintenance is provided on request. Fuel, oil, and oxygen are available for all types of aircraft at Chambers. Electrical and air starting units are available on a first come-first served basis. Consult your latest IFR Supplement for current information on servicing prior to landing, as things could change as the energy crisis fluctuates. Aircraft needing a compass swing can utilize the compass roses at Chambers and the heliport upon request. Complete meteorological facilities are available at the Tower (LP-1), including airborne METRO on 268.8 MHz (UHF). The conscientious pilot will always use this facility, as he knows the weather changes frequently in the Tidewater area.

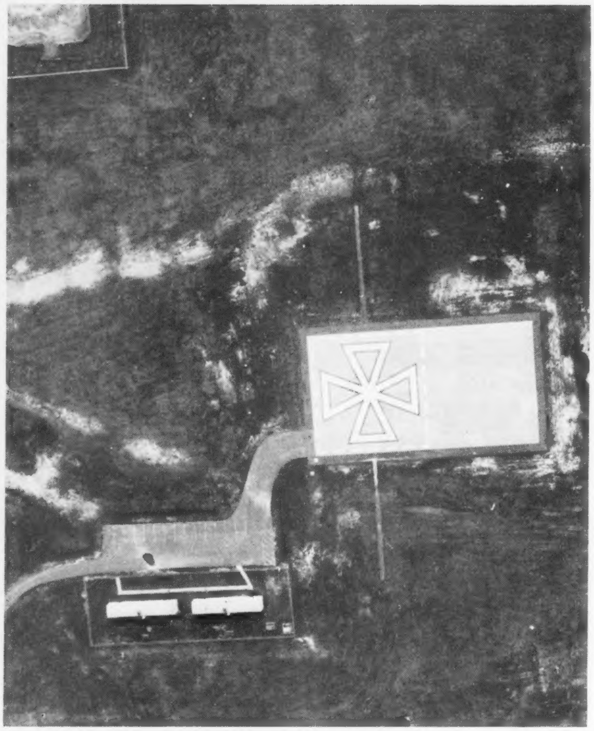
When landing at NAS Norfolk, use the call sign "Chambers Tower." This precludes any confusion with Norfolk International Airport, which lies in proximity to the southeast of Chambers. Chambers Tower is manned 24 hours a day. NAS heliport is manned daily 0630-2230, and there are no tower facilities at the CINCLANTFLT helipad. Contact Chambers Tower 15 minutes out for landing at the "pad."

Personnel desiring government air transportation can obtain information on flights by calling the Flight Information Desk (444-2780, Autovon 690-2780), Monday-Friday, excluding holidays, 0730-1600. At other times, information may be obtained from the NSC Air Terminal (444-4118, Autovon 690-4118) for flights leaving from LP-84, and from the Operations Duty Office (444-2442, Autovon 690-2442) for flights that depart from LP-1. Automated flight information from LP-84 can be obtained by calling 444-4377 or Autovon 690-4377. Information on government ground and commercial air/ground information can also be obtained from these locations. The NSC Air Terminal at LP-84 provides logistic and passenger staging services for USAF Military Airlift Command, USN/USMC aircraft, and certain civilian contract airline flights. Personnel desiring space-available flights in and out of CONUS should check the NSC Air Terminal for this information. Aircrews desiring to contact the NSC Air Terminal Operations while airborne may do so on 349.4 MHz (UHF) or 130.66 MHz (VHF). Customs, Agricultural, and Immigration Services are provided at NAS Norfolk. Consult the IFR Enroute Supplement for hours of service.



NAS Norfolk Heliport

Air Traffic Control Procedures. All aircraft arriving and departing NAS Norfolk shall file an IFR or VFR flight plan (DD-175, ICAO DD-1801). IFR handling is thoroughly encouraged at all times. Exceptions to the IFR handling are provided for emergencies, SAR operations, post-maintenance checkflights, VFR/special VFR/helo ops, and contingency operations directed by higher authority. Arrivals and departures are under the control of radar, but SIDs are encouraged and are available at Base Ops. Arrivals are handled through Norfolk Approach Control, with handoffs to Chambers Radar for PAR/ASR final approaches. TACAN, NDB, VOR/DME, and en route radar approaches are available at NAS Norfolk. Aircraft desiring practice approaches (traffic permitting) should contact Norfolk Approach for appropriate handling.



CINCLANTFLT Helipad

VFR ceiling and visibility minimums are 1500 feet and 3 miles for fixed-wing and 1000 and 3 for helos. The Airfield Operations Officer may suspend VFR operations when marginal weather conditions endanger safety of flight. VFR entry by transport aircraft will normally be made at a 45-degree angle, 1000 feet AGL, maintaining 1000 feet until turning base. Jet and carrier type props will normally enter the initial at least 3 nm out, at a 45-degree angle, break altitude of 1500 feet, descending to 1000 feet downwind and outboard of NAS Heliport. All breaks are over the runway, towards the water. (Note: Maintain at least 750 feet for Runway 1 until turning final due to the proximity of helo arrival/departure routes along the piers and the fixed-wing base leg for Runway 10.)

Chambers has complete crash and rescue facilities available on a 24-hour basis, both air and water capabilities, with helo services provided by NAS Oceana. They are here for your assistance. When in doubt, break them out! The more lead time, the better the response and service.

Special Precautions. At present, and for the next 2 years, NAS Norfolk will be undergoing a major change, primarily to its main runway (10/28). Numerous pieces of construction equipment are moving about or stationary at the west end of the field. Caution is imperative when landing, taking off, or taxiing at Chambers Field. Plan your approaches professionally.

There are many airfields, military and civilian, within a 15-mile radius of NAS Norfolk, making it a high-density traffic area. NAS Oceana, Langley AFB, Norfolk International, and Patrick Henry Airport are the major airfields nearby. Numerous small general aviation fields generate a great amount of traffic in addition to the major airports in the area. A constant lookout is a must in and around the Greater Norfolk area. All approaches are controlled by Norfolk Approach Control, and at times, things get a little congested. Plan accordingly, particularly when the weather is bad . . . and Norfolk gets its share. For the most part, however, the weather is generally good for the flyer and vacationer alike. Tidewater liberty isn't that bad, with its great beaches, sports facilities, and historical landmarks.

Aircrew Facilities. There are facilities to take care of aircrews of all ranks/rates at the NAS complex. Barracks accommodations are very limited for all enlisted grades, and advance reservations are necessary. BOQs are normally available for officers and others authorized to utilize them. In all cases, advance reservations are suggested to ensure availability. Clubs/messes are available for all ranks/rates. Meals are readily available at the clubs and several cafeterias near LP-1 and LP-84. The NSC Air Terminal at LP-84 has a snack bar which is open 24 hours a day. LP-1 has a variety of vending machines available. Inflight rations can be obtained through airfield operations and should be ordered between 0530 and 1700 daily. Three hours lead time is usually required.

On/off station transportation (official and unofficial) information is available through Base Ops personnel. Commercial transportation (taxi/bus/air) is also readily available from NAS Norfolk. Just ask for assistance and the friendly personnel will gladly provide the help requested.

The commanding officer, his staff, and the personnel of NAS Norfolk extend their welcome to those on official business or routine visits to the Tidewater area. They, and we at APPROACH, hope that the information in this Airfield Profile will assist you when you next fly to Norfolk, where you and SAFETY are always welcome!

By LCDR Lynford S. Walters
VQ-4

MIDAIRS

What are your odds?

OH MY GOSH . . . Here it is . . . I'm sorry for everything, Mom . . . a gray and white blur flashes by your aircraft, missing it by a gnat's tail. There is little doubt in your mind that the other pilot is just as impressed as you are, and that his adrenalin is also flowing like warm beer. This is more than a topic for happy hour, this is the real thing! It's not the least bit entertaining to watch a cockpit window fill with 40 tons of metal; it's downright humbling. Now what? File a near-miss report like the thousands of others sent out each year? How did you get here?

While the first midair encounters were probably with one of our fine feathered friends, it wasn't long before we moved into the bulk vs. bulk era. Literally thousands of aircraft and thousands of lives have been lost because of improper visual scans. The ingenuity of human minds to find new ways to collide with each other has been unparalleled in recent years. While the trend has been downward, evidence from the Naval Safety Center indicates that midair mishaps are beginning to climb again. We know that, due to the inherent hazards associated with military aviation, our flight maneuvers are fraught with potential disasters. Formation flight, ACM, and inflight refueling lead the pack in midair mishap evolutions. However, the VP and VQ communities have established oceanic operational VFR flights throughout the world in recent years, clearly sliding their odds toward possible unwelcome encounters.

What is so frightening about a midair collision is the lack of opportunity for preparation, and the speed at which it occurs. Virtually all aircraft emergencies are covered under Section V of our little blue books, and training enhances system knowledge to ensure an analytical solution. But knowing your own bird like a book doesn't help when a cockpit that isn't yours is staring you in the face. The situation can get out of control so rapidly that many pilots accept the possibility of a midair collision fatalistically. Add this to the knowledge that our air traffic control and radar facilities are often overloaded, and that virtually all aircraft-to-aircraft collisions are in day, VFR weather, there appears to be little reason to approach the problem rationally.

Experience has not been proven to be a helpful or preventative factor. The young are too afraid to look out for fear of totally losing their grip in a flying evolution they are unsure of to begin with, and the old figure that, if they made it this long, the other fellow must be looking out. Yet it happens to these two groups of pilots and all those in between. Whether it's fear or complacency, the result will be the same. The cause factor, "failed to maintain proper lookout doctrine," is a rather terse obituary to mark the close of a fulfilling life.

We've all heard the best prevention advice – "head and eyes *out* of the cockpit." Throughout flight training, the dents in our helmets, so carefully placed by instructors' kneeboards, gave us constant reenforcement to keep a good lookout. Yet even this basic precept is violated so often that it's almost accepted procedure, especially since there are so many other things the pilot has to do in our busy

skies. Fortunately, some homework has already been done to comprehensively review midair mishap prevention. The Aircraft Owners and Pilots Association (AOPA) Safety Foundation, with NTSB, FAA, and NASA assistance, has developed a collision avoidance checklist. Primarily designed for civil aviation, it is nonetheless very applicable to our environment, and reads as follows.

Check yourself. Your eyesight is directly dependent on your physical and mental condition. More than one of us has strapped on an aircraft without the proper mental discipline. Use your head, not your ego.

Plan ahead. Have all your charts and approach plates folded in proper sequence and within handy reach. Keep the cockpit free of clutter and be familiar with headings, altitudes, distances, etc. It's certainly less than desirable to be fumbling around with papers in the most congested traffic area of your flight.

Clean windows. We're all aware of the "death wish" of millions of bugs each summer. Do not accept windows that are less than spotless.

Adhere to standard operating procedures. Unauthorized maneuvers or violation of general air discipline has killed more than one. Some accident reports read like fairy tales; playing in the clouds, maneuvers not briefed, and less than successful canopy rolls. The Air Force has documented midair collisions from wingmen holding movie cameras. If as much original thought were placed on avoidance of trouble . . .

Avoid crowds. Paranoia in a traffic pattern is probably a healthy approach to longevity. High concentrations of aircraft proportionately increase the chance for an unwelcome encounter. If there isn't a good reason to fly below 5000 feet over a civil aerodome, or at any altitude on high density airways, don't do it.

Compensate for design. Every aircraft in our inventory has blind spots. The Safety/NATOPS Officer should address these areas and procedures to compensate for them. By intent, our aircraft are difficult to spot because of camouflage and low contrast paint. Keep your eyes moving.

Equip for safety. Operable transponders and beacons are a good hedge on avoidance when you need them. Don't fly without them.

Talk and listen. It sure is nice to know where the other guy is. If you feel there is any chance of conflict, do him and the controllers a favor and let them know where you are. If an identified aircraft is flying in your area, let someone know and listen up for traffic reports.

Scan. This is the Queen of suggestions. The airline disaster over San Diego served as a grim reminder that positive control allows no grace period. Your eyes are the bottom line of midair prevention. They are limited to a 10-15-degree field of vision in which to focus on and classify an object. Though one may perceive movement in the periphery, it is impossible to identify the objects or the vectors of the problem. The only way to avoid this built-in limitation is to move your head . . . often. You are the only person who can improve this neglected area, and it's a form of training that can pay big dividends.

While in a cockpit, stick and throttle in hand, you are the ruler of your own destiny. Nothing is quite so uncontrolled or gut-reactive as collision avoidance. While it's obvious that it takes two parties to make a collision work, it would have taken only one to avoid it. Don't trust someone else with your life. Heads up!!

I Want to be a Navy Pilot

"I WANT to be a Navy pilot when I grow up because it's fun and easy to do. Pilots don't need much school, they just have to learn numbers so they can read instruments. I guess they should be able to read maps so they can find their way if they are lost. Pilots should be brave so they won't be scared if it's foggy and they can't see or if a wing or motor falls off they should stay calm so they'll know what to do. Pilots have to have good eyes so they can see through clouds and they can't be afraid of lightning or thunder because they are closer to them than we are. The salary pilots make is another thing I like. They make more money than they can spend. This is because most people think airplane flying is dangerous except pilots don't because they know how easy it is. There isn't much I don't like, except girls like pilots and all the stewardesses want to marry them so they always have to chase them away so they won't bother them. I hope I don't get airsick because if I do I couldn't be a pilot and would have to go to work."

A Fifth Grader
Original Source Unknown

LETTERS
to the editor

T-34 Spins

NAS Whiting Field – In the OCT '79 APPROACH article entitled "Getting the Word Out," you make two statements with which I must take exception. First, you allude to the fact that the aircraft alighted "in a flat attitude." Granted, the aircraft was upright where it was found in about 3 feet of water, but it initially hit the water in an approximately 45-degree nosedown attitude. This fact was confirmed by an expert eyewitness and corroborated further by a Beechcraft Corporation structural engineer and a Naval Safety Center accident investigator. Second, you allude to a point in time just prior to the bailout sequence when the pilot "realized that the aircraft was in a much flatter attitude than normal." As one who spent much time analyzing this accident, I recall that the pilot "felt" that the aircraft was in a flatter attitude; in fact, he felt that the aircraft was in a flat spin. However, feeling and realizing are two distinct realms. The fact that the aircraft was not in a flat spin was attested to by the expert eyewitness; the aircraft was in a normal, erect, 45-degree nosedown spin to the right.

We go to great lengths during student and IUT training to dispel any misunderstandings as to T-34C spin characteristics. The T-34C does not spin flat! The flat spin mode was seen once during the wind tunnel tests, and that occurred with extraneous appendages (i.e., soda straws, etc.) attached to the test model. The flat spin mode did not manifest itself beyond this occurrence.

We learned a lot from that first spin crash, and the Fleet should know that spin training is alive and very well at NAS Whiting Field.

As a result of our analysis, a T-34C spin brief evolved which aids us in informing students thoroughly regarding T-34C spin characteristics. If you have any questions, please feel free to call me (AV 868-7565), and if you are ever in town, stop by and we'll go for a "spin."

LT J. C. Grover
T-34C NATOPS Evaluator

• **Your statements are correct. The article was not intended to imply that the aircraft was in a flat spin, only that the pilot felt that it was.**

Crazy Cover

NAS Barbers Point – I was reading a back issue of APPROACH Magazine (AUG '78) and came across an article that interested me, "Contributing to APPROACH Magazine." Later that day, I picked up a more recent issue (FEB '79). I briefly thumbed through it, then put it back where I got it. Glancing at the cover a second time, I quickly became intrigued with the cover photograph.

Being somewhat into photography myself, I was curious as to how the cover photograph was taken from a cramped cockpit. After careful examination and recalling my plane captain days on A-7s, I remembered that the IFR probe is on the starboard side. However, the credit reads: "Our cover photograph by PHC Pierce is a view from the navigator's seat in an F-4B *Phantom* as it prepares to refuel from an A-4 *Skyhawk* tanker."

Attention to detail is important to me; my life as well as that of fellow crewmembers depends upon it. Not meaning to GIG or GOTCHA, but is it possible that the cover of the FEB '79 issue was printed backwards?

I take pride in contributing one of my photographs for the P-3 community, Patrol Wing TWO's Rainbow Fleet aboard NAS Barbers Point, Hawaii, for your consideration. I feel it might make a good cover.

AW3 Patrick K. Smith
Patrol Squadron ONE

• **Good eyes. Yes, the FEB '79 cover was backwards. Hope we got your photo right on this month's cover.**

Friendly Fire!

FPO, New York – A C-2A en route to a carrier operating in the central Med was cleared by Marshal Control into the 1000-foot starboard delta pattern. It was midday and weather conditions were basically VFR. Visibility was about 10 miles at the ship. The C-2A pilot switched to tower, reported he was established in starboard delta, and was acknowledged by the air boss.

The boss, in an excited voice, told the C-2A to immediately fly aft of the ship, after only one-half turn in holding. The C-2A acknowledged, proceeded aft, and asked why the urgency for the instructions. The boss replied that one of the carrier's escort ships had pulled alongside . . . starboard side . . . and had begun to open fire through the starboard delta air space with live ammo!

As the C-2A departed the pattern at max allowable engine power settings (the power levers were bent and firewalled!), white smoke could be seen coming from the bow gun of the escort ship.

This is the first time I've ever been in starboard delta when it was hot! The escort ship was 30 minutes late for her scheduled live ammo fire and was on the wrong side of the carrier! What a story for the families of the crew and passengers of this C-2A to tell . . . that they almost bought the farm due to friendly fire. As the plane commander of this flight, I'm still highly upset at the entire evolution.

LT Ronald B. James, USN
VR-24 LSO

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

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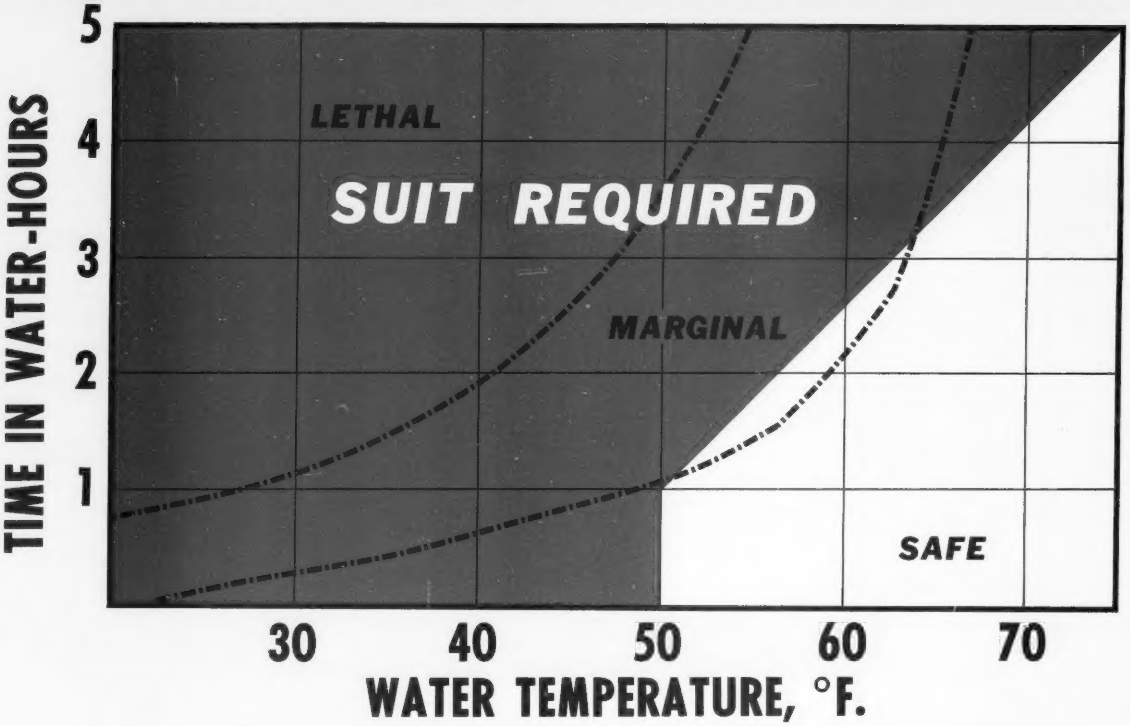
GUIDE TO REQUIREMENT FOR ANTIEXPOSURE SUIT



WINDCHILL FACTOR vs Frostbite Risk on Bare Skin

WIND			AIR TEMPERATURE - CENTIGRADE											
*BS	STRENGTH	M.P.H.	+10	+5	−1	−7	−12	−18	−23	−29	−34	−40	−46	−51
0	Calm	0	10	5	−1	−7	−12	−18	−23	−29	−34	−40	−46	−51
2	Light breeze	4·2	9	3	−3	−9	−15	−21	−26	−32	−38	−44	−50	−56
3	Gentle breeze	8·8	5	−2	−9	−16	−23	−30	−36	−43	−50	−57	−64	−71
4	Moderate "	13	2	−6	−14	−21	−29	−36	−43	−50	−58	−65	−73	−80
4	Moderate "	17·3	0	−8	−16	−24	−32	−40	−47	−55	−63	−71	−79	−87
5	Fresh breeze	22·3	−1	−9	−18	−26	−34	−42	−51	−59	−67	−76	−84	−92
6	Strong breeze	26	−2	−11	−19	−28	−36	−44	−53	−61	−70	−79	−87	−96
6	Strong breeze	30·3	−3	−12	−20	−29	−37	−45	−54	−63	−72	−81	−90	−98
7	Moderate gale	34·7	−3	−12	−21	−30	−38	−46	−55	−64	−73	−82	−91	−100
*Beaufort Scale			LOW				HIGH			VERY HIGH RISK				

and LISTEN!

for launching and recovery operations

NAVAL SAFETY CENTER
NAS NORFOLK, VIRGINIA